

EPA and USGS Proposal to the Gulf Coast Ecosystem Restoration Council-- Streamflow Alteration Assessments to Support Bay and Estuary Restoration in Gulf States

Human alteration of waterways has impacted the minimum and maximum streamflows in more than 86% of monitored streams nationally and may be the primary cause for ecological impairment in river and stream ecosystems. Restoration of freshwater inflows can positively affect shellfish, fisheries, habitat, and water quality in streams, rivers, and estuaries. Increasingly, state and local decision-makers and federal agencies are turning their attention to the restoration of flows as part of a holistic approach to restoring water quality and habitat and to protecting and replenishing living coastal and marine resources and the livelihoods that depend on them.

The U.S. Geological Survey and the U.S. Environmental Protection Agency propose to collaborate on a comprehensive, large-scale, state-of-the-science foundational project to provide vital information on the timing and delivery of freshwater to streams, bays, estuaries, and wetlands of the Gulf Coast. Ecologically relevant streamflow metrics and measures of streamflow alteration will be developed for streams throughout the Gulf states and made available via an online mapping tool. An assessment of trends in streamflow delivery to Gulf coast estuaries will improve the understanding of potential drivers of change in estuarine health. A streamflow accounting model will be developed for one large watershed in the Gulf States to evaluate and understand how streamflow alteration at locations in the upper basins may impact the magnitude, timing, duration, and frequency of freshwater flows to the Gulf. This model will provide local, state, and federal officials the ability to evaluate how streamflow withdrawals and reservoir operations throughout the watershed may alter streamflow metrics and freshwater inputs to the estuary.

Key questions to be addressed include:

Gulf-wide Assessment

- *Which streams in the Gulf States have the largest amounts of streamflow alteration? What are the gaps in stream flow data for assessing streamflow alteration in Gulf States?*
- *Are shifts in magnitude, timing, duration, and frequency of freshwater delivery to estuaries distinguishable from natural signals?*

Large Watershed Assessment

- *How far downstream from alteration points do substantial shifts in streamflow metrics occur?*
- *How sensitive are estuary freshwater inputs to upstream streamflow alterations? Is there a threshold of fresh water alteration below which no signal is detected in an estuary?*

